

COMMISSIONER'S DECISION

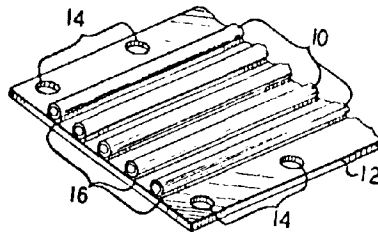
OBVIOUSNESS - Optical Fiber Group

The invention is a particular movable mounting of fine optical fibres on a base tape. The movable arrangement permits easy alignment of the fibres so they may be joined together. The art relied upon by the examiner was not involved with the problem, and the solution utilized was not obviousness.

Final Action: Affirmed in part - amended claims were accepted.

This decision deals with a request for review by the Commissioner of Patents of the Examiner's Final Action dated September 28, 1976, on application 161,365 (Class 88-97). The application was filed on January 16, 1973, in the name of Enrique A.J. Marcatili, and is entitled "Optical Fiber Group." The Patent Appeal Board conducted a Hearing on May 10, 1978, at which Mr. E. Gale represented the applicant. Also in attendance was the United States Patent Agent, Mr. M. DePicciotto.

The application is directed to a particular moveable arrangement of optical fibres mounted on a base tape. The moveable arrangement of the fibres is for proper alignment to facilitate the bonding or splicing of the fibres. Optical fibres may be termed as a solid or liquid core dielectric structure used as waveguides at optical frequencies. Figure 1A illustrates that arrangement:



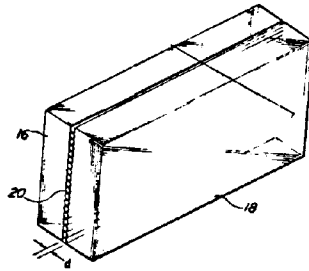
Claim 1 of the application reads:

An optical fiber group comprising: a first tape having a plurality of optical fibers mounted thereon and extending longitudinally therealong; said fibers being mounted on said first tape in a manner which permits transverse displacement of the fiber axes.

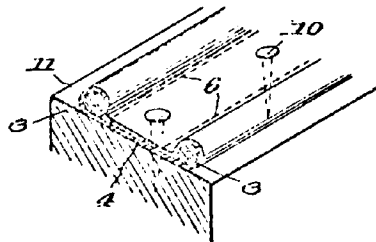
In the Final Action the examiner refused the claims (claims 1 to 9) for "lack of invention" over the following United States patents:

1,859,988	May 24, 1932	Schemmel
2,361,374	Oct. 31, 1944	Abbott
3,272,063	Sept. 13, 1966	Singer, Jr.

The Singer patent, which is the primary reference, is directed to composite supported fibre optic strips. In the preferred embodiment a pair of fibre optic support elements are used. The support elements each have a flat plane surface disposed parallel to each other and separated by a space into which optical fibres are inserted. Suitable fusion is brought about between the materials of support and the optical fibres. That invention is illustrated below:



The Schemmel patent relates to an electric wire conduit consisting of a pair of electrical wires arranged in spaced parallel relationship and attached to a tape. The edges of the tape are folded over the wires and are secured to the exposed portion of the tape between the wires. Figure 3 below of the patent illustrates that invention:



The Abbott patent relates to an insulated electrical conductor construction. The electrical conductors are passed in spaced parallel paths in a common plane through a coating machine, whereby the conductors are sandwiched between two layers of thermoplastic coating material.

In the Final Action the examiner had, inter alia, this to say:

...

Claims 1, 2, 3, 4, 5, 6 and 7 are again rejected as being unpatentable over the fiber optic light transmitting strip disclosed in the Singer, Jr. patent in view of the obviousness of substituting the independent disposition arrangement of energy transmitting elements as illustrated in the Schemmel patent, for the Singer Jr. More compact arrangement of energy transmitting elements, to obtain an optical fiber group as defined in these claims.

Applicant's head claim 1 consists of statements concerned only with the disposition of elongated energy transmitting thread like conductors on a strip of support material.

No reference is made in claim 1 to properties or qualifying characteristics which distinguish new and inventive matter actually being claimed, from what is obvious in view of the prior art cited.

While applicant's response argues patentability of claim 1, relying solely on matter recited in his disclosure, such matter does not appear in the claim and cannot be said to define the scope of the alleged invention claimed.

Applicant's remarks at the bottom of page 1 regarding the Singer, Jr. patent are noted. Although these remarks are relevant within the context of the Singer, Jr. disclosure, they are held to be irrelevant to the definition and scope of applicant's claim 1. In this respect, whether or not Singer, Jr. was concerned with malformation of his fiber group is not relevant to the broad unrestricted terminology recited in applicant's claim 1.

It is evident that Singer, Jr. was aware of the "fusionless" option available to him both from his disclosure relating to excessively small and larger diameter fiber threads and also evident from the Singer, Jr. claim 2 which is entirely silent regarding fusion and malformation of fiber groups.

In consequence of the above comments, a strip of material having plural optical fibers disposed thereon in a manner permitting transverse displacement of the fibers, contains no inventive matter or patentable advance in the art.

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In response to the Final Action the applicant stated (in part):

...

Applicant's specification discloses optical fiber groups as best shown in Figures 1A and 1B of the drawings. The groups generally consist of a number of optical fibers arranged in spaced parallel relationship in a common plane. The fibers are supported by a tape and are secured to the tape or by means of a covering tape (as shown in Figure 1B).

The problem solved by the invention concerns the bonding or splicing of optical fiber groups, which is essential if the fiber groups are to be used as wave guides at optical frequencies in much the same way as wires and metallic wave guides are used at lower frequencies. However, it is well known that there is considerable difficulty in splicing optical fibers because of the need for accurate alignment of the fibers before bonding can take place if an unacceptable amount of light loss is to be avoided at the junction. As stated in the introduction of the applicant's disclosure, when one considers that optical fibers have core diameters ranging from a few microns to a few mils, and that an alignment error of as little as half a diameter will result in a coupling loss of about 3 db, the magnitude of the problem becomes apparent.

The optical fiber groups disclosed in the specification are capable of overcoming this alignment problem in conjunction with the apparatus as shown in Figures 3, 5, 7 and 8 of the drawings. The apparatus forces the fibers of adjacent groups into the proper alignment by the use of an accurately grooved cover plate. However, fibers in the fiber groups must be capable of transverse displacement of the fiber axes, in order to allow the cover plate to align the fiber ends correctly. Thus, the capability of transverse axial displacement is an essential feature of the fiber groups of the present invention.

The invention is applicable either to optical fibers having solid cores or those having liquid cores, and a special procedure is set forth in connection with the liquid core fibers (Figures 8 to 10).

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This argument has been discussed in detail above. Although it may be proper to rely on art from analogous fields, it should be carefully considered whether, in fact, the fields are analogous in relation to the problems solved by applicant's invention. In this case, this is not so for the reasons given above, namely that the method of joining electrical conductors is unrelated to the method of splicing optical fibers. Although no judicial support can be found for the following proposition, it is reasonable to assume that fields of art are analogous when a person skilled in the art of one of the fields would immediately see that similar problems could be encountered in the other field.

In this case, it is believed that a person skilled in the fiber optics art would not think of studying the electrical conductor art for a solution to the splicing problem because it is well known that the high degree of alignment necessary in splicing optical fibers is unnecessary in joining electrical conductors. Thus, the arts are non-analogous.

...

The consideration before the Board is whether or not the claims define a patentable advance in the art. In the Final Action the examiner refused the claims only and was concerned with the scope of monopoly of the invention defined in the claims.

At the Hearing Mr. Gale argued strongly that the claims were clearly directed to patentable subject matter. He also discussed and submitted a new proposed claim 1 and stated that he was willing to consider other appropriate amendments if necessary. This claim will be considered later.

We have carefully reviewed all the cited art and we find the applicant has developed solutions to problems which were not taught by the cited patents. The problem "solved by the invention concerns the bonding or splicing of optical fiber groups, which is essential if the fiber groups are to be used as wave guides at optical frequencies." It is well known that there is considerable difficulty in splicing optical fibres because of the need for accurate alignment of the fibres before bonding can take place, if an unacceptable amount of light loss is to be avoided at the junction. It must be kept in mind that optical fibres have core diameters ranging from a few microns to a few mils. It follows that a small alignment error will result in a considerable coupling loss.

The patent to Singer is the only reference which is concerned with optical fibres, but is not in any way concerned with splicing of the fibres, Singer clearly does not teach the invention of the present application; the description of his invention, as discussed above, is totally different from that of the present application. This art in fact leads away from the applicant's teaching since it teaches firmly affixing the fibers in position. In contrast the

applicant's invention, interia alia, requires that the fibers be movably secured to a base tape. The patents to Schemmel and Abbot relate to a different technology, i.e. "metallic conductors" and they are of general interest only. There is no problem of precision alignment in the metallic fibre art, where connections can be made by twisting the wire ends together without abutment of the ends of the wires.

The examiner, as mentioned, was concerned with the scope of monopoly of the invention defined in the claims. He did not refuse the application. We find, without any hesitation, that present claim 1, supra, the only independent claim, does not define the scope of monopoly in distinct terms commensurate with what, in our view, is the invention described in the disclosure and illustrated in the drawings. For example, it refers to a "first" tape without in any way indicating what other tapes are present, also the term "mounted on" does not, in our view, properly define the scope of monopoly of the invention described in the specification. The reason for considering this claim is because Mr. Gale argued at the Hearing that it defines patentable subject matter. This claim, in our view, should be refused, and in that respect the examiner's rejection is supported.

We will now consider proposed claim 1 which was discussed at the Hearing.

It reads:

An optical fiber group comprising a first tape having a plurality of optical fibers mounted thereon and extending longitudinally therealong, wherein the fibers are mounted on the first tape in a manner which permits transverse displacement of the fiber axes, such that said fibers are easily alignable with corresponding fibers of another identical fiber group.

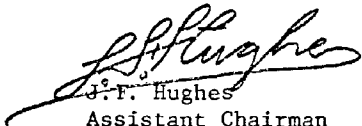
Minor amendments to this claim were suggested to Mr. Gale by phone, because this claim, in our view, was still indefinite, e.g. it refers to a first tape and the term mounted, in our view, requires that it be specific to, "... by means of limited bonding...." We also recommend that, under the circumstances, the functional result should be included in the claim, i.e. "to facilitate bonding or splicing of the fibres." This, in our view, more clearly defines the advance in the art.

On May 25, 1978, Mr. Gale, in accordance with our discussion, submitted a new claim 1, which reads:

An optical fiber group comprising a plurality of optical fibers supported upon a base tape and arranged in parallel relationship in a common plane, the fibers being movably secured to the tape by means of limited bonding to allow for ease of alignment with another identical fiber group to facilitate bonding or splicing of the fibers.

Other minor amendments were suggested by the applicant to the disclosure and dependent claims, which reflect the amendments made to claim 1. We recommend that these amendments also be accepted.

In the circumstances, no further discussion need be made because, in our view, the proposed claims now define the extent of the scope of monopoly to which protection may be granted, and avoids the objection of obviousness made by the examiner against the original claims.



J.F. Hughes
Assistant Chairman
Patent Appeal Board, Canada

I have reviewed the prosecution of this application and I agree with the recommendation of the Patent Appeal Board. Accordingly, I will accept the amendments to the application, dated May 25, 1978, when submitted in appropriate form. The application is returned to the examiner.



J.H.A. Gariepy
Commissioner of Patents

Agent for Applicant

Kirby, Shapiro, Curphey & Eades
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Dated at Hull, Quebec
this 12th day of June, 1978